

Zhicong Zhang

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EDUCATION

1. Zhejiang University - University of Illinois at Urbana-Champaign Institute

Undergraduate in Mechanical Engineering, 3.95/4.00, rank 1/43

Awards: National scholarship, Merit Scholarship, Elite student

2. Stanford University

Master in Mechanical Engineering, 3.85/4.00

RESEARCH EXPERIENCE

1. Exploring Skin Potential Signals in Electrodermal Activity (Zhejiang University)

Mentor: Prof. Yubo Li (Zhejiang University Electronix & Mechanix Engineering Lab)

Description:

Collected fasciocutaneous electrical signals from human participants and small white mice.

Processed the experimental data by integrating, classifying, normalizing, and constructing datasets in MATLAB, including basic discrete big-data handling.

Extracted time-domain, frequency-domain, and nonlinear features using MATLAB, applying FFT, one-dimensional wavelet analysis, and wavelet packet decomposition.

Applied machine-learning methods to explore the relationship between fascial electrical signals and concentration, and ultimately published a research paper in IEEE Acess based on these findings.

2. State anxiety and stress detection and monitoring using multimodal wearable (UIUC)

Mentor: Prof. Manuel Enrique Hernandez, Ph.D (UIUC Department of Translational and Biomedical Sciences), Maxine He, Ph.D (UIUC Human Dynamics and Controls Lab)

Description:

Participated in experiments collecting human EEG and ECG signals. Used MATLAB and Python to preprocess the data, including filtering, artifact removal, and segmentation. Performed statistical and HRV-related analysis in Kubios and organized the extracted features into a structured dataset. Contributed to interpreting preliminary results and helped prepare the final conference abstract summarizing the study.

3. ToddlerBot Project(Stanford)

Mentor: Prof. Karen Liu (Stanford TML Lab), Prof. Shuran Song (Stanford REAL Lab), Haochen Shi (Stanford TML lab & REAL lab), Weizhuo Wang (Stanford TML lab)

Description:

Contributed to the full-stack development of ToddlerBot from version 1.0 to 3.0, spanning mechanical design, electrical integration, sensing, embedded control, system-level optimization, and real world and hardware-aware RL the future

For ToddlerBot 1.0 → 2.0: Improved overall hardware robustness and reliability by redesigning structural components across the torso, pelvis, arms, and legs; streamlined CAD architectures and assembly workflows; strengthened sensing and control pipelines to support stable locomotion and more consistent system performance. Contributed to Locomotion beyond feet project.

For ToddlerBot 3.0: Led the development of the new Autonomous Charging System, including a complete redesign of the robot's power architecture, creation of custom DC-DC and protection modules, and the design of a robust magnetic charging interface and charging station. Developed the corresponding navigation and control policy needed for autonomous docking.

PUBLICATION

1. T. H. Yang, J. Hu, H. Shi*, Z. Zhang, D. Jiang, W. Wang, Y. He, Z. Wu, Y. Hou, M. Kennedy, S. Song, K. Liu. "Locomotion Beyond Feet" Submitted to ICRA 2026.
- 2.Yiyang Huang, Zhicong Zhang, Yanbin Yang, Pu-Chun Mo, Zhenghao Zhang, Jiadong He, Shaohua Hu, Xiaozhi Wang, Yubo Li. Exploring Skin Potential Signals in Electrodermal Activity: Identifying Key Features for Attention State Differentiation. Access-2024-17758, DOI: 10.1109/ACCESS.2024.3406932.
- 3.He, M., Cerna, J., Huang, Y., Zhang, Z., Wu, C., Hsiao-Wecksler, E.T., Hernandez, M.E. (2023). "An Examination of EEG-ECG Coupling Under Stressful and Non-stressful Conditions.", Society for Psychophysiological Study Annual Meeting 2023, New Orleans, LA, USA. September 27 - October 1, 2023.

Intern experience

YunshenTech

Assisted in tuning and evaluating the Model Predictive Control (MPC) framework on Shadow-3 quadruped robot. Design LiDAR camera mount for Shadow-3 quadruped robot.

ACADEMIC PROJECTS

CS 106B(C++), EE 227(Robot Perception), CS229(Machine Learning), AA274 A&B(Principles of Robot Autonomy I&II), AA273(State Estimation and Filtering), CS224R(Deep Reinforcement Learning)

EXTRACURRICULAR ACTIVITIES

International Concrete Dragon Boat Race(First Prize)

Designed the structure of boat using Solidworks

Used STM32 to control the motor system, establish the whole control and electronic system
Hydrodynamic simulation using Solidworks

Built VORON2.4 3D printer by myself

Established control circuit using Raspberry pi 3.

Designed and completed the circuit of the entire printer.

Used Eagle to draw PCB boards.

Robomaster robot competition

Built robots by ourselves using CNC, 3D printing and casting

Improved and deployed motion algorithm(MPC), use STM32 to control robot motion, and improve robot shooting function with vision algorithm(CNN).

Attended Robomaster robot competition held by DJI.

SKILLS

CAD: SOLIDWORKS, CREO, Onshape .

Programming: Python, C++, ROS2, MATLAB.

PCB design: KiCad, Eagle.

Knowledge: Control (FK/IK, Low-level control(PID),Linear MPC, RL control(PPO), system Identification), Perception (State estimation, classical CV, Deep learning Vision, basic SLAM), Planning(A star, RRT, frontier exploration), Learning(Deep learning, RL, Imitation Learning)

Familiar with IMU, Servo motor(Dynamixel), other embedded systems and sensors.